Can technology empower the public to think scientifically? The case of nQuire

Conference or Workshop Item

Can technology empower the public to think scientifically? The case of nQuire

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Abstract: nQuire (nquire.org.uk) is an innovative citizen science (CS) platform for learning, developed at the Open University UK in collaboration with the British Broadcasting Corporation (BBC). It operationalizes the concept of 'citizen inquiry', that is the fusion of citizen science and inquiry-based learning. It enables members of the public to join or set up their own investigations or 'missions' to explore themselves and their environment. Each mission involves finding out about how CS works at scale and gaining insight into current issues such as personal wellbeing. An example of an nQuire mission is Gardenwatch; this is a survey of UK private gardens, produced by BBC Springwatch and the British Trust for Ornithology. Over 200,000 people completed surveys of their gardens on nQuire, as well as sharing their findings on social media. We are now researching how to capture and improve the impact of nQuire on citizens' learning and engagement. Our vision is to educate the general public in thinking scientifically through engagement with nQuire missions.

Introduction

The degree of public engagement with Citizen Science (CS) varies from initiating a research activity to contributing to processes of data collection and analysis (Shrink et al., 2012), the latter being prominent in the field. Attention has recently shifted from scientist-led CS to active engagement by members of the public in scientific activities that are not restricted to processes of data collection and analysis (Herodotou et al., 2018; Konig, 2017). Also, the importance of devising personally-meaningful investigations by having citizens devise their own research agendas that match their needs and interests has been emphasised (Anastopoulou, et al., 2012). The nQuire platform (nquire.org.uk) is an innovative CS platform that has been iteratively designed (Author 1, 2018) to enable members of the public to set up their own investigations and act as scientists. The platform allows citizens not only to contribute to projects but also design, run and manage projects within a single learning environment. The vision of the nQuire platform is to educate the public in thinking scientifically through the support of technology and knowledgeable others (Herodotou et al., 2017).

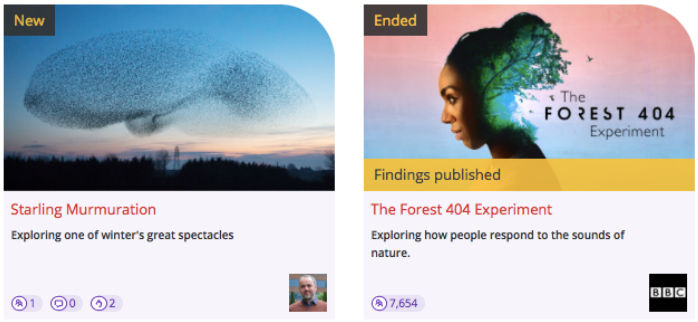
nQuire has been proven to successfully enable members of the public to engage in large-scale interactive surveys and science investigations into wellbeing, community and environment. Over 200,000 people learned about their gardens and wildlife by taking part in a set of structured investigations into garden birds, mammals and insects (see Gardenwatch missions on nQuire). In addition, 43,000 people discovered how getting creative could improve their wellbeing (The Feelgood Test) and 7,000 people explored how environmental sounds can evoke positive and negative responses (The Forest 404 experiment). In the next section we describe the functionality of the platform, to emphasise the dynamic nature of nQuire and the support of multiple roles and forms of participation from joining existing investigations to setting up and managing a new mission.

What are the affordances of nQuire?

Joining an existing mission

Investigations on nQuire are called 'missions'. The platform supports confidential and social missions. In confidential missions, all data are anonymised before sending for analysis. In social missions, all responses are open for others to view and discuss online. An example of a confidential mission is 'The Forest 404 experiment' asking people to imagine a stressful situation, listen to nature-based sounds and report their feelings. An example of a social mission is 'Starling Murmurations' asking people to take and upload pictures of murmurations and answer questions such as where these have been observed (see Figure 1). Owners of the mission can download data in spreadsheet format and they can provide immediate and personalised feedback based on users' responses. Results from a mission can be published on the platform.

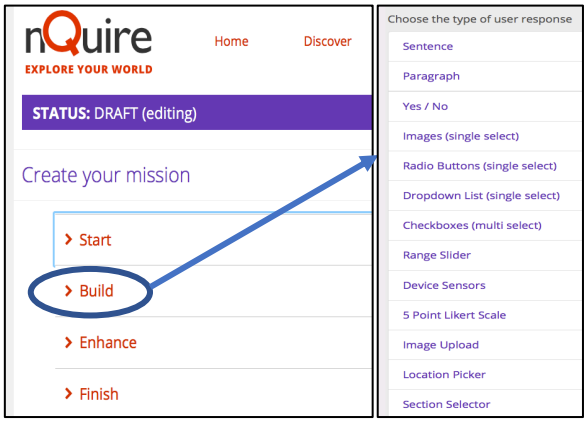
Figure1. Examples of missions on nQuire



Authoring a mission

The platform provides a tool to create new missions by: setting a 'big question', providing an outline of the mission, adding a variety of response types (such as dropdown lists, Likert scales and sliders), scoring each response category, and authoring customised feedback to the participant based on the scores. Responses can be in the form of a text, geolocated image or sensor-data (See Figure 2). The mission can be divided into sections, with separate feedback from each section. All missions are checked before they go live, to make sure they are safe and legal while customised consent forms (See Figure 3) ensure participants are aware of how their data will be processed.

Figure 2: The authoring tool functionality



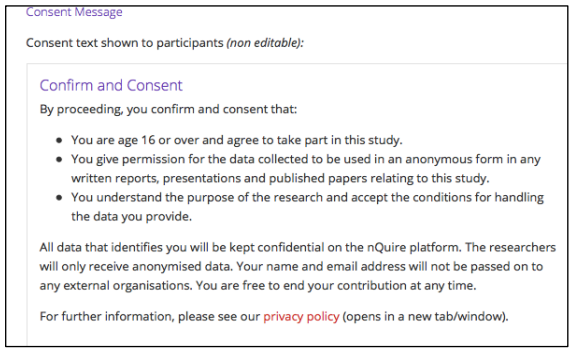


Figure 3: Customised consent forms

Future steps

nQuire has been designed with an educational objective in mind, that of developing citizens' scientific skills and competences. Certain design features can support learning including (a) the provision of personalised feedback, (b) publishing of interim and final mission results, (c) learning by doing – taking part in the missions or authoring missions, (d) learning through communication with a community of inquiry. Future studies will focus on understanding whether and what the public may learn from joining nQuire by engaging citizens as co-designers in producing missions as well as capturing possible impact from taking part in existing investigations.

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